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EXAMINER	
ABDALLA, KHALID M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/565,352	ZHU ET AL.	
	Examiner	Art Unit	
	KHALID ABDALLA	2475	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/19/ 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2,5-6 and 10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Ishwar et al (US 20040017816 A1) in views of Lyer et al (US 20030133412).

Regarding claim1 Ishwar et al disclose a Multi-Protocol Label Switch (MPLS) processing method applied in a multi-port Virtual Local Area Network (VLAN) (Fig. 4 shows multi port VLAN p1-p8) (a technique for managing traffic in a multiport network node, and more particularly, to a technique for managing traffic in a multiport network node that is connected to another network node by a tunnel, for example, a stacked virtual local area network (VLAN) tunnel or a multi protocol label switching (MPLS) tunnel see [0002] lines 1-5), wherein the VLAN includes a node (Fig. 1A shows network node A and B , Fig. 3 shows SPED s A and B) with a MPLS table item managing module (exit port table lookup) (using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port table lookup is the MPLS tunnel in which the packet should be forwarded see [0049] lines 14-18) and the method comprises steps of: establishing a label switch path (LSP) (an MPLS tunnel 808 is implemented at Layer 2 using a static LSP that connects physical port P.sub.3 of SPED A to physical port

P.sub.4 of SPED B. Tunneling using a static LSP involves specifying the particular LSP that is to be used to connect the two SPEDs see [0045] lines 5-8) , by the node in the multi-port VLAN (Fig.4 A shows device A with multi ports) , through a label distribution protocol (LDP)(the LSP on which the packet travels may be mapped to a physical port of the SPED (which acts as the ingress label edge router). The actual LSP that corresponds to the MPLS tunnel is dynamically determined by an LDP see [0051] lines 11-14) , and obtaining information binding a forwarding equivalence class (FEC) and a label or information binding an ingress label and an egress label (The Ethernet packet is then mapped to a user-defined Forwarding Equivalence Class (FEC), which defines how the packet gets forwarded. An FEC lookup yields the outgoing physical port and two MPLS labels .The first MPLS label is placed at the top of the label stack and is referred to as the "tunnel label." The tunnel label is used to carry the frame across the intermediate network. The second label is placed at the bottom of the label stack and is referred to as the "VC label." The VC label is used by the egress label edge router (i.e., the SPED at which the packet exits the MPLS domain) to determine how to process the packet see [0044] lines 5-13), and an address of a LDP peer entity at an opposite end, which is a next-hop IP address (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9)

Creating a forwarding-relation table, and adding a forwarding-relation table item based upon the obtained information (After the destination MAC address has been learned, the packet can be forwarded using the logical port. In an embodiment, using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port table lookup is the MPLS tunnel in which the packet should be forwarded. In this case, the packet is forwarded on LSP 650. The packet is forwarded, as described above, with two MPLS labels. The outer MPLS label being the tunnel label and the inner label being the VC label see [0049] lines 10-17) obtaining, a specific egress port corresponding to the forwarding-relation table item from the multiple ports of the VLAN (Fig. 12 A and Fig. 4 shows multi port VLAN p1-p3) based upon the next- hop IP address (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9) and accomplishing, by the node in the multi-port VLAN (Fig. 12 A and Fig. 4 shows multi port VLAN e.g. p1-p3), the MPLS via the specific egress port (FIG. 12A depicts that logical port LP.sub.3.600 connects SPED A with port P.sub.5 of SPED B via logical path 1212 and that logical port LP.sub.MPLS.5000 connects SPED A with port P.sub.8 of SPED C via logical path 1213. At SPED A, a broadcast domain that connects to customer C, locations at SPEDs B and C can be created simply by adding physical port

P.sub.1, logical port LP.sub.3.600, and logical port LP.sub.MPLS.5000 to the broadcast domain for VLAN 100 see [0054]lines 19-25). Although Ishwar et al disclose (the process of binding a physical port and a stacked VLAN tunnel to a logical port involves allocating a table entry in an exit port table for the logical port. The table entry maps the logical port to the physical port of exit and to the VLAN ID See [0038] also (an exit port table for a match to the logical port. The result of the exit port table lookup is the physical port to which the packet should be forwarded and the VLAN ID for the stacked VLAN tunnel in which the packet is to be forwarded see [0040] lines 13-16) . But Ishwar et al does not explicity disclose MPLS table. Lyer et al from the same or similar field of endeavor teach MPLS table (label information base (LIB) tables for the label-switched path see [0037] lines 2-3). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Lyer et al in the system of Ishwar et al .The method of Ishwar et al can be implemented on any type of method MPLS table item managing module which is taught by Lyer et al with a motivation in order to an efficient apparatus and method for interworking between MPLS network and non MPLS network.

Regarding claim2 Ishwar et al disclose the method, wherein the step of creating the forwarding-relation table and adding the forwarding-relation table item based upon the obtained information (After the destination MAC address has been learned, the packet can be forwarded using the logical port. In an embodiment, using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port table lookup is the MPLS tunnel in which the packet should be forwarded. In this case, the packet is forwarded

on LSP 650. The packet is forwarded, as described above, with two MPLS labels. The outer MPLS label being the tunnel label and the inner label being the VC label see [0049] lines 10-17) further comprises steps of:

creating a forwarding-relation table item of FTN for a label edge router (LER) in the VLAN, which indicates a mapping of a forwarding equivalence class (FEC) (The Ethernet packet is then mapped to a user-defined Forwarding Equivalence Class (FEC), which defines how the packet gets forwarded see [0044] lines 5-7) to a next-hop label forwarding entry (NHLFE) (Using MPLS, incoming packets are assigned a "label" by a "label edge router." Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet see [0043] lines 2-8) ; and creating an forwarding-relation table item of Incoming Label Map (ILM) for a label switch router (LSR) in the VLAN, wherein the forwarding-relation table item of ILM indicates a mapping of an input label to the NHLFE (incoming packets are assigned a "label" by a "label edge router." Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet see [0043] lines 3-8).

Although Ishwar et al disclose (the process of binding a physical port and a stacked VLAN tunnel to a logical port involves allocating a table entry in an exit port table for the

logical port. The table entry maps the logical port to the physical port of exit and to the VLAN ID See [0038] also (an exit port table for a match to the logical port. The result of the exit port table lookup is the physical port to which the packet should be forwarded and the VLAN ID for the stacked VLAN tunnel in which the packet is to be forwarded see [0040] lines 13-16) . But Ishwar et al does not explicity disclose MPLS table. Lyer et al from the same or similar field of endeavor teach MPLS table (label information base (LIB) tables for the label-switched path see [0037] lines 2-3).Thus it would have been obvious to one of ordinary skill in the art to implement the method of Lyer et al in the system of Ishwar et al .The method of Ishwar et al can be implemented on any type of method MPLS table item managing module which is taught by Lyer et al with a motivation in order to an efficient apparatus and method for interworking between MPLS network and non MPLS network.

Regarding claim 5 Ishwar et al disclose The method, wherein further comprising steps of the MPLS table item managing module (exit port table lookup) (using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port table lookup is the MPLS tunnel in which the packet should be forwarded see [0049] lines 14-18) distributing the relevant forwarding-relation table item to the maintaining and managing module to create the forwarding-relation table (After the destination MAC address has been learned, the packet can be forwarded using the logical port. In an embodiment, using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port

table lookup is the MPLS tunnel in which the packet should be forwarded. In this case, the packet is forwarded on LSP 650. The packet is forwarded, as described above, with two MPLS labels. The outer MPLS label being the tunnel label and the inner label being the VC label see [0049] lines 10-17), maintained by the maintaining and managing module; and the maintaining and managing module maintaining a correspondence relation of the next- hop IP address and the forwarding-relation table item (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9). Although Ishwar et al disclose (the process of binding a physical port and a stacked VLAN tunnel to a logical port involves allocating a table entry in an exit port table for the logical port. The table entry maps the logical port to the physical port of exit and to the VLAN ID See [0038] also (an exit port table for a match to the logical port. The result of the exit port table lookup is the physical port to which the packet should be forwarded and the VLAN ID for the stacked VLAN tunnel in which the packet is to be forwarded see [0040] lines 13-16) . But Ishwar et al does not explicity disclose MPLS table. Lyer et al from the same or similar field of endeavor teach MPLS table (label information base (LIB) tables for the label-switched path see [0037] lines 2-3) Thus it would have been obvious to one of ordinary skill in the art to implement the method of Lyer et al in the system of Ishwar et al .The method of Ishwar et al can be

implemented on any type of method MPLS table item managing module which is taught by Lyer et al with a motivation in order to an efficient apparatus and method for interworking between MPLS network and non MPLS network.

Regarding claim 6 Ishwar et al disclose The method, wherein the step of the MPLS table item managing module distributing the relevant forwarding-relation table item to the maintaining and managing module (After the destination MAC address has been learned, the packet can be forwarded using the logical port. In an embodiment, using logical port LP.sub.MPLS.650 to forward the packet out of the SPED involves searching an exit port table for a match to the logical port. The result of the exit port table lookup is the MPLS tunnel in which the packet should be forwarded. In this case, the packet is forwarded on LSP 650. The packet is forwarded, as described above, with two MPLS labels. The outer MPLS label being the tunnel label and the inner label being the VC label see [0049] lines 10-17) further comprises steps of for the LER in the VLAN (The VC label is the label on which the far-end SPED (which acts as the egress label edge router) will receive the packet. The VC label may also be referred to as the "receive label." The VC label may be used by the far-end SPED to identify the VLAN to which a packet belongs and to make further forwarding decisions see [0047] lines 16-20) the MPLS table item managing module sending the information of the forwarding-relation table item of FTN to the maintaining and managing module; and for the LSR in the VLAN ("label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet.

See [0043] lines 5-8) the MPLS table item managing module sending the information of the forwarding-relation table item of ILM to the maintaining and managing module. (Using MPLS, (incoming packets are assigned a "label" by a "label edge router." Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label see [0043] lines 2-6) . Although Ishwar et al disclose (the process of binding a physical port and a stacked VLAN tunnel to a logical port involves allocating a table entry in an exit port table for the logical port. The table entry maps the logical port to the physical port of exit and to the VLAN ID see [0038] also (an exit port table for a match to the logical port. The result of the exit port table lookup is the physical port to which the packet should be forwarded and the VLAN ID for the stacked VLAN tunnel in which the packet is to be forwarded see [0040] lines 13-16) . But Ishwar et al does not explicity disclose MPLS table. Lyer et al from the same or similar field of endeavor teach MPLS table (label information base (LIB) tables for the label-switched path see [0037] lines 2-3). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Lyer et al in the system of Ishwar et al .The method of Ishwar et al can be implemented on any type of method MPLS table item managing module which is taught by Lyer et al with a motivation in order to an efficient apparatus and method for interworking between MPLS network and non MPLS network.

Regarding claim 10, Lyer discloses The method, wherein in a distributed forwarding system, the method further comprises a step of converting the forwarding-relation table item created by the MPLS table item managing module (MPLS-enabled routers and

LSP are connected to the VLANs see [0023] also see Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]). In to a format required by micro-codes and distributing the forwarding-relation table item to the micro-codes (program constructs a VLAN-ID table in LAN switch see[0044] lines 1-11). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Lyer et al in the system of Ishwar et al .The method of Ishwar et al can be implemented on any type of method wherein in a distributed forwarding system, the method further comprises a step of converting the forwarding-relation table item created by the MPLS table item managing module into a format required by micro-codes and distributing the forwarding-relation table item to the micro-codes which is taught by Lyer et al with a motivation in order to an efficient apparatus and method for interworking between MPLS network and non MPLS network.

3. Claims 3-4 and 7-9 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Ishwar et al (US 20040017816 A1) in views of Lyer et al (US 20030133412) as applied in claim 1 and further in view of Tingley et al (US 20020138628 A1).

Regarding claim3 Ishwar et al disclose the method, wherein the step of obtaining the egress port corresponding (An FEC lookup yields the outgoing physical port and two MPLS labels see [0044] lines 7-8) to the forwarding-relation table item based upon the next-hop IP address (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the

packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9) further comprises steps of:
the MPLS table item managing module (Lyer et al MAC label information base (LIB) tables for the label-switched path see [0037] lines 2-3). Ishwar et al and Lyer et al does not disclose searching an address resolution protocol (ARP) table based upon the next-hop IP address to judge whether there is a corresponding table item of ARP;
if there is a corresponding table item of ARP, establishing a correspondence relation of the forwarding-relation table item and a corresponding egress port and physical MAC address in the table item of ARP based upon information of the corresponding egress port and MAC address; and if there is no corresponding table item of ARP, marking the forwarding-relation table item with an UNAVAILABLE sign, and obtaining information of the egress port with a data flow which triggers a corresponding action based upon an actual data flow. Tingley et al from the same or similar endeavor teach searching an address resolution protocol (ARP) table based upon the next-hop IP address to judge whether there is a corresponding table item of ARP (each Virtual Networking Device maintains a separate table for each Virtual Network that requires address translation. When attempting to transmit IP traffic over a given Virtual Network, the Virtual Networking Device looks up the entry corresponding to the destination IP address in the translation table for that Virtual Network see [0013] lines 2-6) if there is a corresponding table item of ARP, establishing a correspondence relation of the forwarding-relation table item and a corresponding egress port and physical MAC address in the table item of ARP based upon information of the corresponding egress port and MAC address

(each Virtual Networking Device maintains a separate translation table having the format shown in FIG. 5. The translation table 120 includes a number of entries 122. Each one of the entries 122 defines a mapping between a virtual IP address within a Virtual Network and an Ethernet/MAC address. The information in each of the entries 122 reflects information received in a response message to a request message 30 as shown in FIG. 2. see [0049] lines 3-8) and if there is no corresponding table item of ARP, marking the forwarding-relation table item with an UNAVAILABLE sign, and obtaining information of the egress port with a data flow which triggers a corresponding action based upon an actual data flow (The translation table (120 in FIG. 5) for the virtual router is searched for an appropriate entry. If an appropriate entry is found, the resolution is complete. Otherwise, an ARP request is issued for the address, and the address and packet to be transmitted are added to a table of unresolved entries see [0046] lines 1-4). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Tingley et al in the system of Ishwar et al and Lyer et al .The method of Ishwar et al and Lyer et al can be implemented on any type of method searching an address resolution protocol (ARP) table based upon the next-hop IP address to judge whether there is a corresponding table item of ARP if there is a corresponding table item of ARP, establishing a correspondence relation of the forwarding-relation table item and a corresponding egress port and physical MAC address in the table item of ARP based upon information of the corresponding egress port and MAC address; and if there is no corresponding table item of ARP, marking the forwarding-relation table item with an UNAVAILABLE sign, and obtaining information of

the egress port with a data flow which triggers a corresponding action based upon an actual data flow which is taught by Tingley et al with a motivation In order to support computer networks and communication systems by means of extending the address resolution protocol (ARP) for use in Internet Protocol (IP) Virtual Networks.

Regarding claim4 Ishwar et al and Lyer et al does not disclose the method, wherein the step of obtaining the information of the egress port with the data flow if there is no corresponding table item of ARP further comprises steps of: transmitting an ARP broadcast request in the VLAN based upon the next-hop IP address and an egress interface VLAN receiving an ARP response message sent from the opposite end; relearning and obtaining the egress port and MAC address corresponding to the next-hop IP address based upon the received ARP response message sent from the opposite end; and a maintaining and managing module of the VLAN notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding- relation table item based upon the received ARP information. Tingley et al from the same or similar field of endeavor teach wherein the step of obtaining the information of the egress port with the data flow if there is no corresponding table item of ARP further comprises steps of: transmitting an ARP broadcast request in the VLAN based upon the next-hop IP address and an egress interface VLAN (each Virtual Networking Device maintains a separate table for each Virtual Network that requires address translation. When attempting to transmit IP traffic over a given Virtual Network, the Virtual Networking Device looks up the entry corresponding to the destination IP address in the translation

table for that Virtual Network see [0013] lines 2-6); receiving an ARP response message sent from the opposite end; relearning and obtaining the egress port and MAC address corresponding to the next-hop IP address based upon the received ARP response message sent from the opposite end (each one of the MPLS switches 90, 92 and 94 operate to issue the disclosed request messages as shown in FIG. 2 to the IP address of the next-hop switch for the MPLS tunnel 100. In response, the destination device issues a response including its physical address (Ethernet/MAC address). Subsequently, all packets sent through the MPLS tunnel 100, regardless of whether they are on Virtual Network A 102 or Virtual Network B 104, are transmitted using the physical address of the next-hop see [0048]) ; and a maintaining and managing module of the VLAN notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding- relation table item based upon the received ARP information (a translation table 120 used to store information mapping virtual IP addresses to Ethernet/MAC addresses. In an illustrative embodiment, each Virtual Networking Device maintains a separate translation table having the format shown in FIG. 5. The translation table 120 includes a number of entries 122. Each one of the entries 122 defines a mapping between a virtual IP address within a Virtual Network and an Ethernet/MAC address. The information in each of the entries 122 reflects information received in a response message to a request message 30 as shown in FIG. 2. see [0049] lines 1-8). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Tingley et al in the system of Ishwar et al and Lyer et al .The method of Ishwar et al and Lyer et al can be implemented on any type of

method wherein the step of obtaining the information of the egress port with the data flow if there is no corresponding table item of ARP further comprises steps of: transmitting an ARP broadcast request in the VLAN based upon the next-hop IP address and an egress interface VLAN; receiving an ARP response message sent from the opposite end; relearning and obtaining the egress port and MAC address corresponding to the next-hop IP address based upon the received ARP response message sent from the opposite end; and
a maintaining and managing module of the VLAN notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding- relation table item based upon the received ARP information which is taught by Tingley et al with a motivation In order to support computer networks and communication systems by means of extending the address resolution protocol (ARP) for use in Internet Protocol (IP) Virtual Networks.

Regarding claim 7 Ishwar et al disclose The method, wherein the step of the maintaining and managing module maintaining the correspondence relation of the next-hop IP address and the forwarding-relation table item (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9) further comprises steps of. Ishwar et al and Lyer et al does not disclose when an ARP is

deleted, the maintaining and managing module notifying the MPLS table item managing module to update the forwarding-relation table item related to the ARP; and

setting an INVALID flag bit for the forwarding-relation table item related to the ARP.

Tingley et al from the same or similar endeavor teach when an ARP is deleted (the table entry will eventually time out, and be deleted from the table of unresolved entries, resulting in the queued packet being discarded see[0065] lines 4-6)

the maintaining and managing module notifying the MPLS table item managing module to update the forwarding-relation table item related to the ARP (the MPLS switches may need to use ARP to discover Layer 2 Ethernet/MAC address information for each other in order to transmit the MPLS packets, for example in the case where the MPLS switches 90, 92 and 94 are deployed over Ethernet or Gigabit Ethernet. In such a scenario, the encapsulating property of the MPLS protocol separates the Virtual IP Network traffic of Virtual Network A 102 and Virtual Network B 104 from the underlying physical link see [0048]); and

setting an INVALID flag bit for the forwarding-relation table item related to the ARP (each Virtual Networking Device maintains a separate list of "unresolved" ARP mappings, consisting of IP addresses for which ARP requests have already been sent, but for which responses have not yet been received SEE [0014]lines 2-5) and (The Ether Type fields 40 and 44 include values indicating that the packet is an ARP packet, and the ARP data field 46 may contain any other relevant data see [0040] lines 1-3).

Thus it would have been obvious to one of ordinary skill in the art to implement the method of Tingley et al in the system of Ishwar et al and Lyer et al .The method of

Ishwar et al and Lyer et al can be implemented on any type of method when an ARP is deleted, the maintaining and managing module notifying the MPLS table item managing module to update the forwarding-relation table item related to the ARP; and setting an INVALID flag bit for the forwarding-relation table item related to the ARP. Tingley et al with a motivation In order to support computer networks and communication systems by means of extending the address resolution protocol (ARP) for use in Internet Protocol (IP) Virtual Networks.

Regarding claim 8 Ishwar et al and Lyer et al does not disclose The method, wherein the step of setting the INVALID flag bit for the forwarding-relation table item related to the ARP further comprises steps of:

in a distributed forwarding system, notifying micro-codes to set the INVALID flag bit for the forwarding-relation table item in the micro-codes which is related to the ARP; and

in a non-distributed forwarding system, the MPLS table item managing module setting the INVALID flag bit for the forwarding-relation table item which is related to the ARP.

Tingley et al from the same or similar field of endeavor teach wherein the step of setting the INVALID flag bit for the forwarding-relation table item related to the ARP(each Virtual Networking Device maintains a separate list of "unresolved" ARP mappings, consisting of IP addresses for which ARP requests have already been sent, but for which responses have not yet been received SEE [0014]lines 2-5) and (The Ether Type fields 40 and 44 include values indicating that the packet is an ARP packet, and the ARP data field 46 may contain any other relevant data see [0040] lines 1-3) further comprises steps of:

in a distributed forwarding system, notifying micro-codes to set the INVALID flag bit for the forwarding-relation table item in the micro-codes which is related to the ARP; and in a non-distributed forwarding system, the MPLS table item managing module setting the INVALID flag bit for the forwarding-relation table item which is related to the ARP (The Virtual Router associated with the value in the VLAN ID field 42 then operates to translate the IP address of the request into the associated Ethernet/MAC address, for example using the translation table 120 shown in FIG. 5. If no entry is found in the table 120 matching the IP address of the request and the Virtual Network indicated by the contents of the VLAN ID field 42, then no response message is generated by the Virtual Networking Device that received the request message 30. In this way, only the Virtual Networking Device configured within the Virtual Network associated with the request message 30 will return an Ethernet/MAC address to the requesting device see [0041] lines 1-14) . Thus it would have been obvious to one of ordinary skill in the art to implement the method of Tingley et al in the system of Ishwar et al and Lyer et al .The method of Ishwar et al and Lyer et al can be implemented on any type of method wherein the step of setting the INVALID flag bit for the forwarding-relation table item related to the ARP further comprises steps of:

in a distributed forwarding system, notifying micro-codes to set the INVALID flag bit for the forwarding-relation table item in the micro-codes which is related to the ARP; and in a non-distributed forwarding system, the MPLS table item managing module setting the INVALID flag bit for the forwarding-relation table item which is related to the ARP which is taught by Tingley et al with a motivation In order to support computer networks and

communication systems by means of extending the address resolution protocol (ARP) for use in Internet Protocol (IP) Virtual Networks.

Regarding claim 9 Ishwar et al and Lyer et al disclose The method, wherein the step of the maintaining and managing module maintaining the correspondence relation of the next-hop IP address and the forwarding-relation table item (Packets are forwarded along a "label switch path" (LSP) through a series of connected "label switch routers." Each label switch router makes forwarding decisions based on the contents of the label. At each hop, the label switch routers strip off the existing label and apply a new label that tells the next hop how to forward the packet. LSPs are provisioned using Resource Reservation protocol (RSVP) and Label Distribution protocol (LDP) see [0043] lines 3-9) further comprises steps of:

when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table maintained by itself as to whether there is a table item related to the ARP; if not, no process being performed, otherwise judging whether a new egress port is consistent with the egress port corresponding to the original forwarding-relation table item; and if consistent, maintaining the original forwarding-relation table item, otherwise notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding-relation table item (the binding process involves specifying the MPLS tunnel and the destination IP address of the destination SPED (which also acts as the egress label edge router). In Operation, the MPLS tunnel ID is used to identify the actual LSP on which a

packet travels. Likewise, the LSP on which the packet travels may be mapped to a physical port of the SPED (which acts as the ingress label edge router). The actual LSP that corresponds to the MPLS tunnel is dynamically determined by an LDP. In an embodiment, the logical port includes a binding to the VC ID that is to be used for the VC label see [0051] lines 7-15). Ishwar et al and Lyer et al does not disclose when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table maintained by itself as to whether there is a table item related to the ARP; if not, no process being performed, otherwise judging whether a new egress port is consistent with the egress port corresponding to the original forwarding-relation table item. Tingley et al from the same or similar field of endeavor teach when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table maintained by itself as to whether there is a table item related to the ARP; (If an ARP reply to the request issued in (a) above is received, the table entry for the destination IP address is moved to the table of resolved addresses, and the queued packet is transmitted using the newly-discovered layer 2 address information. Otherwise, the table entry will eventually time out, and be deleted from the table of unresolved entries, resulting in the queued packet being discarded. Redundant ARP requests may be periodically retransmitted until this time out occurs see [0065]). Thus it would have been obvious to one of ordinary skill in the art to implement the method of Tingley et al in the system of Ishwar et al and Lyer et al .The method of Ishwar et al and Lyer et al can be implemented on any type of method when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table

maintained by itself as to whether there is a table item related to the ARP ,if not, no process being performed, otherwise judging whether a new egress port is consistent with the egress port corresponding to the original forwarding-relation table item which is taught by Tingley et al with a motivation In order to support computer networks and communication systems by means of extending the address resolution protocol (ARP) for use in Internet Protocol (IP) Virtual Networks.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(US 20010049739 A1), (Wakayama et al) discloses, Apparatus and method for interworking between MPLS network and non MPLS network.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHALID ABDALLA whose telephone number is (571)270-7526. The examiner can normally be reached on Monday thru Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dang Ton can be reached on 571-272-3171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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